# A REINTERPRETATION OF LEUCAENA AND LYSILOMA

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THERE HAVE BEEN in recent years several papers dealing with the correct names for two species of mimosoid legumes native to the West Indies. The lead tree, or jumbie bean, usually known as *Leucaena glauca* Bentham or "(Willd.) Bentham," is commonly cultivated and widely naturalized both in the Americas and in the Old World. This species is the type of the genus *Leucaena*. The wild tamarind is native to the Bahamas, Cuba, Hispaniola, and southern Florida. This species, the type of the genus *Lysiloma*, is generally called either *Lysiloma latisiliquum* (L.) Bentham or *L. bahamense* Bentham.

There is general agreement that *Leucaena glauca* cannot be used as the name of the lead tree. The whole affair was carefully discussed by De Wit (1961), who pointed out that Bentham's name is based upon "*Acacia glauca* Willd."; nomenclaturally this name represents a transfer to *Acacia* of *Mimosa glauca* L., described in the first edition of *Species Plantarum*. However, Willdenow's description and the specimens in the Willdenow herbarium (IDC 7440. 1389: II. 5, 6, 7, 8, 9) which he annotated as *A. glauca* refer to a species quite different from *Mimosa glauca* of 1753.

The identity of *Mimosa glauca* of 1753 is clear. The name, lectotypified by De Wit (1961) through the choice of a specimen from Adrian van Royen's herbarium at Leiden, is that of an *Acacia*, usually called *A. villosa* (Sw.) Willd., but correctly named *A. glauca* (L.) Moench. However, Linnaeus saw more mimosoid legumes during the next few years, his concept of the species changed, and "*Mimosa glauca*" of the second edition of *Species Plantarum* is not the species of the first edition. In fact, as discussed by De Wit, this second *M. glauca* is the lead tree, as is *Acacia glauca* Willd. One could treat Willdenow's *Acacia glauca* as a new name, but De Wit pointed out that an earlier name for the lead tree already existed. During the eighteenth century this species was cultivated in European botanic gardens, and in 1783 it was described by Lamarck as *Mimosa leucocephala* from a plant in the Jardin du Roi in Paris. The description and the specimens in Lamarck's herbarium (IDC 6207. 204: II. 6, 7) leave no doubt that this is the lead tree; De Wit therefore made the combination *Leucaena leucocephala* (Lam.) De Wit.

However, Gillis and Stearn (1974) have re-examined the matter, and they contend that there is in the first edition of *Species Plantarum* a name for the lead tree, i.e. *Mimosa latisiliqua*, serving as basionym for *Leucaena latisiliqua* (L.) Gillis. This is a drastic change, for this Linnaean name has for a century been applied not to the lead tree but, as *Lysiloma latisiliquum* (L.) Bentham, to the wild tamarind. For the

latter species Gillis and Stearn use the name *Lysiloma bahamense* Bentham.

At the heart of the problem lies the typification of the name *Mimosa latisiliqua*. The protologue of Linnaeus (Sp. Pl. ed. 1. 1: 519. 1753) is:

21. MIMOSA inermis, foliis bipinnatis; partialibus quinquejugis: propriis decemjugis. *latisiliqua.*
Acacia non spinosa, siliquis latis compressis, flore albo.
*Plum. spec.* 17.
*Habitat in* America *calidiore.*
Bracteae *dimidiato-cordatae.* Pedunculi *terni*; Flores *capitati.*

In the Linnaean herbarium (LINN) there are three sheets annotated as *M. latisiliqua* and numbered by the late Spencer Savage as 1228.19, 1228.20, and 1228.21 (IDC 177. 716: I. 4, 5, 6, 7). The two latter need not be considered, for each bears the notation by the younger Linnaeus that it was received in 1777. The first sheet, 1228.19, indeed bears a specimen of the lead tree and was annotated by Linnaeus as "21. latisiliqua H. [ortus] U. [psaliensis]" and later by J. E. Smith as "glauca." Gillis and Stearn argue at length that there can be no doubt that Linnaeus had this specimen, taken from a plant cultivated in the garden at Upsala, at hand when he drafted the protologue and that the details of the phrase-name are based upon it; they therefore chose it as lectotype of the name.

They do admit that the specimen on sheet 1228.19 does not agree in all details with the protologue, for the plant has leaves with either five or six pairs of pinnae, not consistently five, and the pinnae have ten to twelve pairs of leaflets, rather than only ten, but they point out that there is variation in these leaf characters and that Linnaeus might have had available other specimens, perhaps from the same tree, or that he, humanly, might have been careless.

The arguments of Gillis and Stearn were put forth in rebuttal to those of De Wit, who in 1961 had typified the name, not by the specimen in the Linnaean herbarium, but by a drawing made by Charles Plumier. The drawings made in the West Indies by Plumier were published only long after his death by Johan Burman of Amsterdam, from 1755 to 1760, as *Plantarum Americanarum Fasciculus . . . continens Plantas, quas olim Carolus Plumierius, Botanicorum Princeps, Detexit, Eruitque, Atque in Insulis Antillis ipse depinxit.* The history of Plumier's drawings and of Burman's publication of them was discussed by Gillis and Stearn (*loc. cit.*)

The drawing published by Burman in 1755 as *tabula sexta* in the first fascicle depicts the wild tamarind and agrees exactly with Linnaeus's phrase-name in that each leaf has five pairs of pinnae and each pinna has ten pairs of leaflets. Could Linnaeus have seen the drawing? No doubt he did, in 1738 in Leiden, for Herman Boerhaave had a set of copies of Plumier's drawings, the "Codex Boerhaavianus," which on Boerhaave's death went to Burman, who eventually published them. Could Linnaeus have remembered one mimosoid legume seen in 1738 when he

drafted *Species Plantarum* during the 1740's, or did he see Burman's plates before their publication?

De Wit maintains that Linnaeus must have done one or the other, for the details of bracts and peduncles in the protologue could have come only from Plumier's drawing. Gillis and Stearn point out that there exists no evidence that Linnaeus made detailed notes when he saw the drawings in 1738, and, moreover, that *M. latisiliqua* does not appear in the 1746–1748 draft copy of *Species Plantarum* in the library of the Linnean Society. They further point out that there is no evidence in Burman's correspondence with Linnaeus that he could have seen this plate before *Species Plantarum* was published. They have therefore typified the name by the specimen in the Linnaean herbarium, and Gillis has made the combination *Leucaena latisiliqua* (L.) Gillis for the lead tree.

It is of some practical importance to determine the correct names for these two species, since each is the type of its genus, and the lead tree is widely grown beyond its natural range and is naturalized in many areas of the Old World tropics, e.g., India, Malaysia, Indonesia, and Australia.

When Bentham described *Leucaena* in 1842, he included the lead tree, as *L. glauca*, and three other species. He described *Lysiloma* in 1844, including the wild tamarind as *L. bahamensis*, and six additional species. The description of *Lysiloma* notes "Stipulae saepius foliaceae v. membranaceae"; that of *Leucaena* says nothing of stipules. It is clear that Bentham intended *Lysiloma* to include species with conspicuous, leaflike stipules. In his "Revision of the Suborder Mimoseae" (1875), Bentham replaced his own earlier name for the wild tamarind with *L. latisiliqua* (L.) Bentham and described the stipules as being leaflike, ovate, acute, and semicordate and auriculate at the base. He also remarked, "Plumier's figure and description, upon which Linnaeus established the species, leaves no doubt as to the identity of his plant with the one above described."

To return to the Linnaean protologue: (1) the phrase-name itself is descriptive of both the specimen in the Linnaean herbarium and of Plumier's drawing, but more exactly so of the latter; (2) Plumier's polynomial from his *Catalogus* (1703) could refer to any one of many mimosoid legumes; but, (3), the details of "bracts" (i.e. stipules) and of peduncles Linnaeus must have had from some source other than the specimen on sheet 1228.19 — the details are exactly descriptive of Plumier's drawing. The protologue is, perhaps, based upon two elements, but one of these surely was Plumier's drawing, and in the interests of nomenclatural stability, it is by this that the name should be typified.

Gillis and Stearn offer in support of their arguments the statement made by Philip Miller in 1759 that Linnaeus's *M. latisiliqua* was the same as the lead tree grown as *Acacia non spinosa, . . . , siliquis longis planis* in the Chelsea Physic Garden. But there is another contemporary comment to be considered. Burman's *Plantarum Americanarum* . . . consists not of illustrations alone. The ten fascicles include 262 pages of text. For each species depicted, there is given in the text the name used by Plumier and the phrase-name from *Species Plantarum* if Linnaeus ac-

cepted the species, as well as synonyms and a short description. The text accompanying *tabula sexta*, the drawing of the wild tamarind, gives Linnaeus's phrase-name for *M. latisiliqua* and a clear reference to its page and number in *Species Plantarum*. Burman, friend and correspondent of Linnaeus, clearly considered Plumier's drawing to represent *M. latisiliqua*.

We regret that we must disagree with Dr. Gillis and Dr. Stearn, but we think that there is very strong evidence that the protologue of *Mimosa latisiliqua* is based, at least in part and likely in its whole, upon Plumier's drawing of the wild tamarind. When and where Linnaeus saw the drawing and thus refreshed his memory of the species we do not know, but the description of "bracteae dimidiato-cordatae" and of "pedunculi terni" did not come from the specimen chosen as lectotype by Gillis and Stearn. Those features he must have seen on the drawing. One cannot now prove that Linnaeus did not see the drawing after 1738 any more than we can prove that he did see it at some later time, but there is no other source for those details about the "bracts," details which indicate that Linnaeus was referring to a species of *Lysiloma*, not to a *Leucaena*. We therefore agree with De Wit that the correct name for the wild tamarind is *Lysiloma latisiliquum* (L.) Bentham, that of the lead tree, *Leucaena leucocephala* (Lam.) de Wit.

There have for many years been controversy and confusion about the correct application of these names, so that much material in herbaria is wrongly named. Furthermore, in the only recent flora for any of the Antilles where the two genera occur, *Flora de Cuba* (Vol. 2, 1951) of Brothers León and Alain, *Lysiloma sabicu* is described as *L. latisiliqua* (L.) Bentham, and the true *Lysiloma latisiliqua* is under the name *L. bahamense* Bentham.

We have studied and examined both literature and the specimens in the herbaria of the Gray Herbarium and the Arnold Arboretum. To aid in clarifying the application of the names we have cited representative specimens of each of the species.

## KEY

Pinnae 3–10 pairs; leaflets (9–)13(–20) pairs, acute; stipules lacking or spinescent; flowers usually perfect, each subtended by a peltate bract; stamens 10, free, the anthers versatile, introrse, usually somewhat pilose; pollen shed as single grains; infructescences with several fruits borne from each one, the fruits slender, flat, not coiling; seeds brown and compressed. . . . . *Leucaena leucocephala.*

Pinnae 1–many pairs; leaflets small and numerous or larger and with fewer pairs, petiolar nectary present at least below the lowest pair of pinnae; larger leaflets obovate, obtuse; stipules foliaceous, obovate, or ovate and auriculate; flowers perfect or the lowermost staminate; stamens monadelphous, united for one-fourth to ca. one-half the length of the filaments, the anthers peltate; pollen shed in 16-grained polyads; fruit broad, often twisted at the base, the valves eventually separating from the sutures. . . . . *Lysiloma.*

Pinnae 3–4 pairs; leaflets 3–6 pairs, petiolulate, obovate, obtuse, with second-

ary venation conspicuously reticulate, 1–2.3 cm. long, 0.6–1.5 cm. wide; stipules obovate, ± persistent. ..... *Lysiloma sabicu.*

Pinnae 2–4 pairs; leaflets 11–26 pairs, essentially sessile, elliptic, narrowly obtuse, secondary venation obscure, 0.9–1.5 cm. long, 0.4–0.7 cm. wide; stipules cordate-ovate, auriculate at base, caducous. . *Lysiloma latisiliquum.*

**Leucaena leucocephala** (Lam.) de Wit, Taxon **10**: 53. 1961.

*Mimosa leucocephala* Lam. Encycl. Méth. Bot. **1**: 12. 1783. HOLOTYPE: Lamarck herbarium *s. n.* (P).

*Acacia leucocephala* (Lam.) Link, Enum. Hort. Berol. pars 2. 444. 1822.

*Mimosa glauca* sensu Linnaeus, Sp. Pl. ed. 2. **2**: 1504. 1763, non *M. glauca* L. Sp. Pl. ed. 1. **1**: 520. 1753 = *Acacia glauca* (L.) Moench, Meth. Pl. 466. 1794 (see De Wit, Taxon **10**: 50–54. 1961; *Ibid.* **24**: 352. 1975).

*Acacia glauca* sensu Willd. Sp. Pl. **4**: 1075. 1806. The description given by Willdenow is that of *M. glauca* from the second edition of Linnaeus's *Species Plantarum*, but nomenclaturally, the combination is based on *M. glauca* L. of the first edition. = *Acacia glauca* (L.) Moench.

*Leucaena glauca* "(Willd.)" Bentham, Jour. Bot. **4**: 416. 1842. This combination is based upon "*Acacia glauca* Willd." (see above).

REPRESENTATIVE SPECIMENS from Bermuda, the Bahama Islands, and the Greater and Lesser Antilles. **Bermuda.** Paynter's Vale, *Moore 3133* (A). **Bahama Islands.** NORTH BIMINI: without exact locality, *Howard & Howard 9984* (GH). **Cuba.** Vicinity of Santiago City, *Pollard et al. 287* (A). **Jamaica.** Buff Bay and vicinity, *Mason 10338* (GH). **Dominican Republic.** Guayubin, *Abbott 981a* (GH). **St. Thomas.** Without exact locality, *Eggers 270* (A). **Tortola.** Without exact locality, *Fishlock 177* (A). **St. Kitts.** Without exact locality, *Cooley 8796* (GH). **Dominica.** Morne Bruce, Roseau, *Hodge 613* (GH). **Barbados.** Bridgetown, along sea beach, *Potter 5464* (GH). **Trinidad.** Without exact locality, *Broadway s. n.* (GH).

**Lysiloma sabicu** Bentham, Hooker's Jour. Bot. Kew Gard. Misc. **6**: 236. 1854. LECTOTYPE: *Sagra s.n.*, "Havanna" (K).

*Leucaena formosa* Grisebach, Cat. Pl. Cubens. 82 and 284 [addenda] 1866. HOLOTYPE: *Wright 2392* (MA ?), seen in GH.

*Acacia formosa* sensu A. Richard in Ramon de la Sagra. Hist. de l'île de Cuba. Botanique. Plantes Vasculaires 463. 1845, non *A. formosa* Kunth, Mimoses 102. *t. 32.* 1822 [1819].

REPRESENTATIVE SPECIMENS. **Bahama Islands.** GREAT GUANA CAY: without exact locality, *Britton & Millspaugh 2887* (GH). CAT ISLAND: around Wilson's Bay, *Byrne 253* (A). Without exact locality, *Bryant s. n.* (GH). **Cuba.** Rangel, Rosario Mts., *Bro. Alain 49* (GH); near Blue Beach, 3 miles from Guantanamo, *Fairchild 3887* (A). ISLE OF PINES: Rio Jucaro, *Marie-Victorin & Alain 106* (GH). **Haiti.** Slope of M. Haut de St.-Marc, *Ekman H8080* (GH). **Dominican Republic.** Riverbed of Rio San Juan, Hato del Padre, San Juan, *Ekman H13459* (GH).

**Lysiloma latisiliquum** (L.) Bentham, Trans. Linn. Soc. London **30**: 534. 1875.

*Mimosa latisiliqua* L. Sp. Pl. ed. 1. **1**: 519. 1753. LECTOTYPE: *tab. 6* (text,

p. 3), Burman, *Plantarum Americanarum Fasciculus Primus, continens Plantas, quas olim Carolus Plumierius, Botanicorum Princeps, Detexit, Eruitque, Atque in Insulis Antillis ipse depinxit.* 1755.

*Acacia latisiliqua* (L.) Willd. Sp. Pl. **4:** 1067. 1806.

*Lysiloma bahamense* Bentham, London Jour. Bot. **3:** 82. 1844. HOLOTYPE: Bahama Islands, *Swainson s.n.* (K).

*Acacia bahamensis* (Bentham) Grisebach, Fl. Brit. W. Indian Islands 221. 1860.

REPRESENTATIVE SPECIMENS. **United States.** FLORIDA: ca. 1 mile north of Long Pine Key campsite, Everglades National Park, T58S, R36E, *Ward 3933* with *Godfrey & Burch* (GH). **Bahama Islands.** NEW PROVIDENCE: near Nassau, *Curtis 153* (A). RUM CAY: hill overlooking Fort Boyd, *Gillis 6288* (A). MAYAGUANA: Wreck Bay Road, *Gillis & Proctor 11572* (A). **Cuba.** Milpa, Cienfuegos Bay, *Jack 5116* (A); eastern side of entrance to Cienfuegos Bay at Pasa Caballo, opposite Castilla de Jagua, *Wood & Atchison 7444* (A); Guatao, *Bro. León 12473* (GH). **Haiti.** Île la Tortue, between La Vallée & La Roselière, *Ekman H4051* (A); vicinity of La Vallée, Tortue Island, *Leonard & Leonard 15423* (A).

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